The Coates Farm Study 1995-2003

Nitrogen (N) is a vital element in agricultural systems but it is not always efficiently used

Efficient N use makes

- Economic sense
- Environmental sense

Inefficient N use is

- A waste of purchased inputs
- Potentially damaging to the environment

Detailed monitoring of Nitrogen (N) cycling for seven years at the Royal Agricultural College's Coates Farm has provided information on the fate of N in a variety of farming systems and suggested ways of reducing N losses. N use efficiency (NE) is measured as :

N in sold products/total N inputs.

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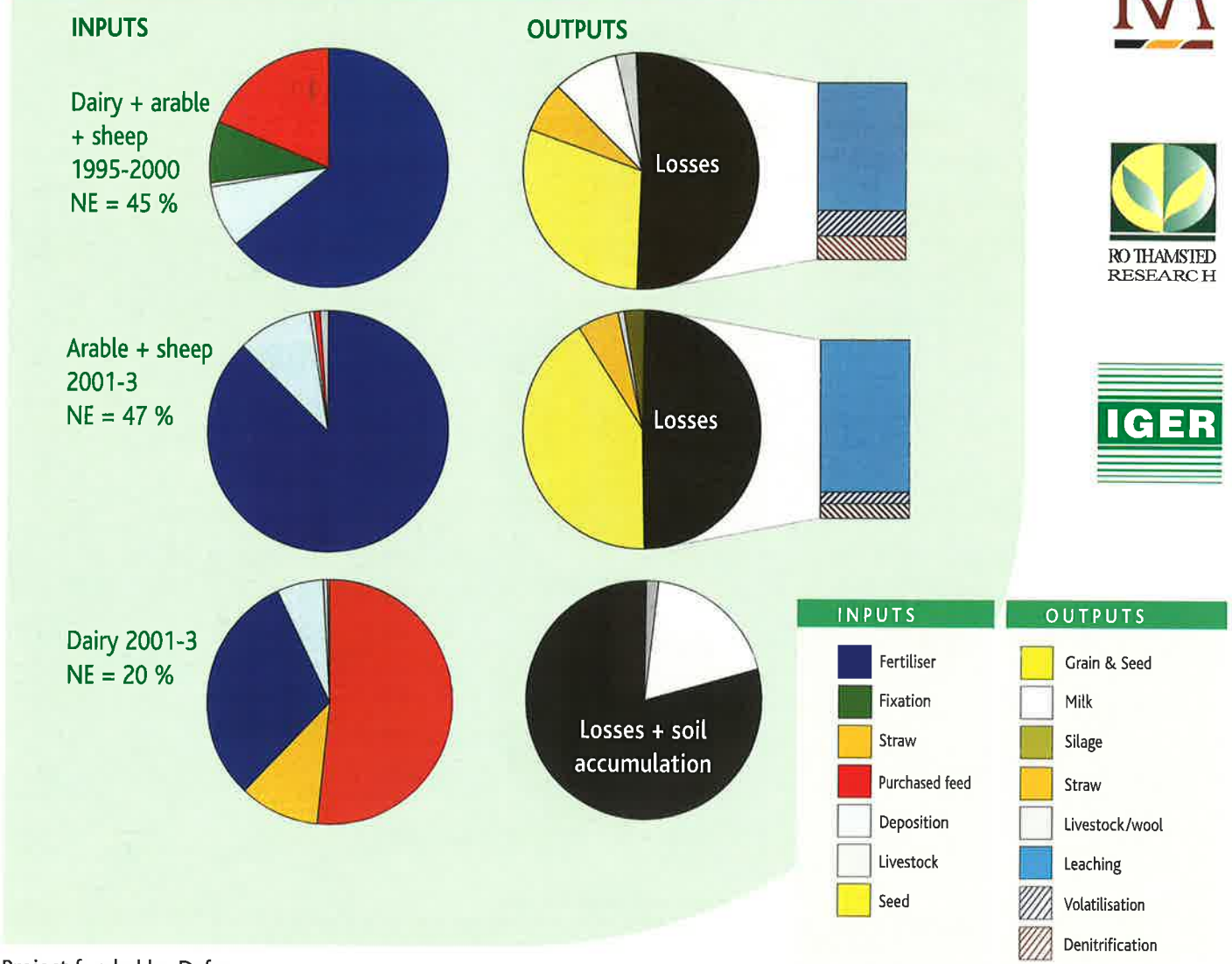
Coates Farm

Soil: Sherborne series - shallow (30 cm), stony clay loam to clay over limestone

Systems: 1995 - 2000: 117 ha arable, 160 dairy cows, visiting sheep.

2001 - 2003: 152 ha arable, 550 ewes; separate dairy, 300 cows, 6945 litres/cow.

Distribution of N inputs and outputs for different farming systems



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In mixed systems in the Cotswolds, fertiliser is the greatest N input and leaching the greatest N loss (average 85 kg N/ha/year). Livestock use N less efficiently than crops.
Some losses of N are inevitable, through natural processes which cannot be fully controlled. The weather will always have a large influence. However, management practices such as those listed below can help to reduce the losses and improve farm nitrogen use efficiency, thus making better use of purchased inputs.

REDUCING N LOSSES ON SOILS PRONE TO LEACHING

AVOID		AIM FOR
Large manure/slurry applications to stubble/fallow in autumn		Slurry applications in spring/summer rather than late autumn/winter
Grazing stubble turnips in wet autumn conditions (earlier grazing, higher leaching losses)		Later grazing of stubble turnips (late Nov-Dec) Reduced stocking rate
Large single N fertiliser applications Early spring fertiliser applications to poorly established cereal crops prior to wet weather		Early autumn crop establishment Amending spring fertiliser applications in the light of spring soil N reserves after soil testing Split N applications resulting in lower rates at each dressing
Intensive cultivations when converting grassland to arable use		Reduced cultivations when converting grassland to arable use

Further details available from:
Dr John Conway, Royal Agricultural College, Cirencester. 01285 652531, john.conway@royagcol.ac.uk
Prof. Keith Goulding, Rothamsted Research, Harpenden, Herts, 01582 763133, keith.goulding@bbsrc.ac.uk
Dr David Hatch, IGER North Wyke, Okehampton, Devon. 01837 883500, david.hatch@bbsrc.ac.uk